

INTRODUCTION

What is the Toxics Release Inventory?

The Toxics Release Inventory, or TRI, is a publicly-available data set containing information reported annually for toxic chemicals manufactured, processed, or otherwise used by certain facilities in Delaware and throughout the United States. Annually, these facilities report releases and waste management information for covered chemicals. The reportable list of toxic chemicals for 2000 included 582 individual chemicals and 30 chemical categories. TRI was established in 1986 under Title III, Section 313, of the Federal Superfund Amendments and Reauthorization Act to provide information to the public about the presence and release of toxic chemicals in their communities. Title III is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA).

Facilities report TRI information to the U.S. Environmental Protection Agency (EPA) and to the State in which the facility is located. In Delaware, the EPCRA Reporting Program within the Department of Natural Resources and Environmental Control (DNREC) receives and compiles TRI data from facilities located within the State. The EPCRA Reporting Program maintains a database that is updated as new reports are received. The database currently contains fourteen years of reported data. Most releases reported under TRI are regulated through Federal and/or State permits.

This report provides a summary and brief analysis of the 2000 TRI data received as of June 21, 2002 from Delaware facilities.

Reporting Requirements

A facility is required to submit a report for a listed toxic chemical if the facility meets all of the following criteria:

1. Employs the equivalent of 10 or more full-time employees,
2. Is a covered industry, or is a federal facility (See Table 1, on the next page, for a list of covered industries), and,
3. Manufactures or processes more than 25,000 pounds, or otherwise uses more than 10,000 pounds, of the listed toxic chemical during the course of the calendar year. Limits for specific chemicals known as PBT's (Persistent Bioaccumulative Toxics) are lower (Table 2 on page 3).

Facilities that meet the criteria for reporting must submit one report for each listed toxic chemical manufactured, processed, or otherwise used above threshold quantities. Facilities must submit these reports to EPA and DNREC by July 1 of each year. The reports cover activities during the previous calendar year. It is important to note that a facility may need to report even if it has no releases of the toxic chemical, because reporting is based on the amount manufactured, processed, or otherwise used, and not the amount released.

**TABLE 1
COVERED INDUSTRIES**

SIC CODES	INDUSTRY
10XX	Metal Mining
12XX	Coal Mining
20-39XX	Manufacturing
4911	Oil and Coal Fired
4931	Electric Utilities
4939	
4953	Facilities Regulated Under RCRA Subtitle C
5169	Wholesale Chemical Distributors
5171	Wholesale Petroleum Stations and Terminals
7389	Solvent Recovery Services
	Federal Facilities

Table 1 provides a list of covered industries along with corresponding 4-digit Standard Industrial Classification (SIC) codes. SIC codes are used to identify the type of activities performed at a facility. Each industry sector represented by facilities reporting in Delaware for 2000 is described in Table 4 on page 5.

The standard report (Form R) contains general facility information and data about on-site releases, off-site transfers, and on-site waste management activities. In lieu of Form R, a short form (Form A) may be used upon meeting certain criteria. After a facility determines that it must report on a given chemical, the facility is eligible to use Form A for that chemical if:

1. The sum of the annual releases, transfers, and wastes managed on-site (known as the "reportable amount") does not exceed 500 pounds, and,
2. The total annual amount of the chemical manufactured, processed, or otherwise used does not exceed 1,000,000 pounds.

Form A, initiated in the 1997 reporting year, is a two-page report that provides facility information (essentially the same as Form R) and the identification of the chemical, but does not provide any release, transfer, or waste management data.

Recent Developments in TRI Reporting

The TRI reporting requirements change as EPA seeks to improve the program through changes to the list of reportable chemicals and through program expansions. As a result of these changes, considerable caution must be exercised when comparing TRI data from previous years.

TABLE 2
PBT CHEMICALS WITH NEW
REPORTING THRESHOLDS
(pounds/year)

Chemical or Chemical Category	New Threshold
Aldrin	100
Benzo[g,h,i]perylene *	10
Chlordane	10
Dioxin and dioxin-like compounds *	0.1 grams
Heptachlor	10
Hexachlorobenzene	10
Isodrin	10
Mercury	10
Mercury compounds	10
Methoxychlor	100
Octachlorostyrene *	10
Pendimethalin	100
Pentachlorobenzene *	10
Polychlorinated biphenyls (PCB's)	10
Polycyclic aromatic compounds	100
Tetrabromobisphenol A *	100
Toxaphene	10
Trifluralin	100

* new this year

Persistent, Bioaccumulative, Toxic (PBT) Chemicals

For reporting year 2000, the subject of this report, and beyond, EPA established substantially lower reporting thresholds for 10 chemicals and three chemical categories that are highly persistent and bioaccumulative in the environment (PBT's).

The new thresholds will apply regardless of whether the PBT chemical is manufactured, processed, or otherwise used. Table 2 provides a list of the chemicals and thresholds. Facilities are required to report on the new chemicals and use the lower thresholds starting with the year 2000 reports. Additionally, EPA has lowered the reporting threshold to 100 pounds for lead and lead compounds, which will change reporting requirements starting with the 2001 reporting cycle.

Industry Expansion

On May 1, 1997, EPA added seven industries to the list of covered facilities under TRI. Prior to the 1998 reporting

year, only manufacturers (SIC codes 20XX-39XX) and federal facilities were required to report (See Table 1 on page 2). EPA included the seven industries because facilities within these industries manufacture and use substantial quantities of TRI chemicals and engage in activities related to those conducted by manufacturing facilities. The industry expansion significantly increased the amount of reported releases. This did not necessarily represent an increase in toxic releases in Delaware, but rather additional information that was made available to the public.

Chemical List Changes

The number of reportable chemicals substantially increased for the 1995 reporting year and beyond, including the addition of over 200 chemicals and six chemical categories. In response to the increased reporting burden on industry resulting from the chemical list expansion of 1995, EPA initiated the use of Form A described on page 2.

The only recent significant deletion was phosphoric acid in 1999. It was reported by 11 facilities in 1998.

Limitations of TRI Data

The user of TRI data should be aware of its limitations in order to accurately interpret its significance.

- **NOT ALL FACILITIES ARE REQUIRED TO REPORT.** Only a small fraction of facilities in Delaware are required to report under TRI due to the criteria listed on pages 1 and 2.
- **OTHER SOURCES NOT COVERED UNDER TRI ALSO RELEASE TOXIC CHEMICALS.** These sources include small businesses, motor vehicles, and agricultural operations. For some chemicals, their use as consumer products is a significant source.
- **FACILITIES ARE ALLOWED TO BASE TRI DATA ON MEASUREMENTS AND MONITORING DATA IF THESE ARE AVAILABLE.** If such data is not available, quantities are estimated based on published emission factors, mass balance calculations, or good engineering judgment.
- **THE DATA ESTIMATION METHODS MAY CHANGE OR VARY.** The methods of estimating, analytical methodology, or basis of calculating data used by different facilities, or even the same facility over time, may vary, and may result in significant changes in reporting while the actual release may remain relatively unchanged. DNREC performs cross-checks of the data with other information sources to verify its accuracy, and contacts facilities concerning apparent discrepancies.
- **THIS DATA DOES NOT INDICATE AMOUNT OF HUMAN EXPOSURE.** An important consideration to keep in mind is that TRI does not provide an indication of potential exposure to the reported releases and cannot be used by itself to determine the impact on public health. The chemical's release rate, toxicity, and environmental fate, as well as local meteorology and the proximity of nearby communities to the release must be considered when assessing exposures.

Despite these limitations, TRI serves as a screening tool to identify areas of concern that may require further investigation.

2000 DATA SUMMARY

Statewide totals of reported 2000 TRI on-site releases, off-site transfers, and wastes managed on-site are provided in Table 3. A total of 76 facilities submitted 363 reports on 108 different chemicals. Of the 363 reports, 61 were submitted using Form A. Four of the newly added chemicals for 2000 were reported, (Benzo (g,h,i) perylene, Octachlorostyrene, Pentachlorobenzene, Tetrabromobisphenol A), and chemicals from both new categories (Dioxin and Dioxin-like compounds, Vanadium compounds) were reported. Air releases constitute 80% of the total on-site releases.

Table 4 provides a description of each SIC industry group and the number of facilities in each group that reported in Delaware. This table also provides on-site releases, off-site transfers, and wastes managed on-site for each group. All three power plants that reported in Delaware combust coal. The one reporting metal mining facility, American Minerals, processes metal ores that they receive by railcar.

TABLE 3
2000 TRI DATA SUMMARY
(IN POUNDS)

No. of facilities	76
No of Form A's	61
No of Form R's	302
No. of Chemicals	108
On-site Releases	
Air	7,840,007
Water	866,312
Land	1,103,632
Total Releases	9,809,951
Off-site Transfers	
POTW's	2,199,807
Recycle	8,491,115
Energy Recovery	2,539,369
Treatment	3,073,791
Disposal	3,814,612
Total Transfers	20,118,694
On-site Waste Mgmt.	
Recycle	31,188,694
Energy Recovery	29,095,221
Treatment	64,404,879
Total on-site Mgmt.	124,688,794
Total Waste	154,617,439

TABLE 4
2000 TRI DATA BY PRIMARY SIC GROUP
(in pounds)

SIC CODE	INDUSTRY GROUP	NUMBER OF REPORTS	NUMBER OF FACILITIES	FORM A	FORM R	ON-SITE RELEASE	OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
10XX	Metal Mining	3	1	0	3	1,594	0	0
20XX	Food Products	27	11	14	13	480,553	4,968	24,820
22XX	Textiles	5	1	1	4	37,426	967,678	4,652,027
24XX	Lumber and Wood Products	3	1	1	2	19,216	0	0
25XX	Furniture and Fixtures	2	1	0	2	29,457	0	0
26XX	Paper Products	1	1	0	1	18,170	11,071	9,972,315
28XX	Chemicals	137	25	11	126	1,491,505	10,686,691	48,518,241
29XX	Petroleum Refining and Products	45	4	1	44	1,790,025	79,682	44,865,163
30XX	Rubber and Plastics	22	13	3	19	86,113	208,782	2,847,169
32XX	Stone, Clay and Glass	1	1	0	1	250	250	0
33XX	Primary Metal	11	2	0	11	25,258	2,336,473	13,100,000
34XX	Fabricated Metal Products	2	1	0	2	0	7,100	3,000
35XX	Machinery, Excluding Electrical	2	1	0	2	250	13,668	0
36XX	Electrical and Electronic Equipment	2	1	0	2	266	4,287,028	0
37XX	Transportation Equipment	33	3	0	33	761,719	1,188,131	134,700
39XX	Miscellaneous Manufacturing	1	1	0	1	2,269	0	0
4911	Oil and Coal Fired Power Plants	33	3	0	33	5,063,488	327,172	571,359
5171	Wholesale Petroleum Terminals	33	5	30	3	2,392	0	0
	TOTAL	363	76	61	302	9,809,951	20,118,694	124,688,794

Tables 5 and 6 show the facility and chemical details for on-site releases, off-site transfers, and on-site waste management for all reporting facilities and chemicals. Table 5 presents the facilities ranked in order of their total on-site releases. The top 5 facilities for 2000 are the same as 1998 except NRG Energy fell to #9 from #4, while DuPont Seaford and Daimler Chrysler each moved up one position. The driving factor for ranking most facilities except DuPont Seaford and Perdue Georgetown (nitrate compounds released to water) is the amount released to air. The Indian River power plant and Motiva had significant releases to land described later in this report, but these did not affect their ranking.

TABLE 5
2000 FACILITY RANK BY ON-SITE RELEASES
(IN POUNDS)

FACILITY	CHEMICALS REPORTED	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
		AIR	WATER	LAND	TOTAL		
INDIAN RIVER POWER PLANT	15	2,647,969	14,796	379,166	3,041,931	4,773	424,799
EDGE MOOR/HAY ROAD POWER PLANT	15	1,845,441	23,137		1,868,578	322,395	146,560
MOTIVA ENTERPRISES	39	1,007,060	25,630	723,063	1,755,753	79,616	44,865,163
DU PONT SEAFORD	13	373,421	427,600	258	801,279	1,040	426,000
DAIMLERCHRYSLER	20	483,604	0	0	483,604	596,690	61,500
PERDUE GEORGETOWN	4	0	326,808	210	327,018	0	0
GENERAL MOTORS	11	278,115	0	0	278,115	471,441	73,200
DU PONT EDGE MOOR	20	199,289	29,299	0	228,588	3,467,214	37,208,000
NRG ENERGY CENTER DOVER	3	152,979	0	0	152,979	3	0
FORMOSA PLASTICS	4	134,526	0	0	134,526	0	158,827
TOWNSENDS	1	121,947	0	0	121,947	0	0
METACHEM PRODUCTS	12	97,154	81	0	97,235	383,299	992,950
REICHOLD INC.	12	39,611	0	0	39,611	2,968	2,518,941
RODEL	5	37,426	0	0	37,426	967,678	4,652,027
KANEKA	2	35,449	1	0	35,450	4	457,992
JUSTIN TANKS	1	34,512	0	0	34,512	573	0
SUNOCO, INC. (R&M) - MARCUS HOOK	2	34,270	0	0	34,270	0	0
CIBA SPECIALTY CHEMICALS	6	33,762	0	0	33,762	4,846,738	262,671
MACDERMID	3	31,907	0	0	31,907	106,095	2,078,635
HIRSH INDUSTRIES	2	29,457	0	0	29,457	0	0
HANOVER FOODS	1	24,000	0	0	24,000	0	0
HONEYWELL	6	23,249	0	0	23,249	94,808	0
CAMDEL METALS	4	20,311	0	0	20,311	64,950	13,100,000
NANTICOKE HOMES	3	19,216	0	0	19,216	0	0
NVF YORKLYN	1	0	18,170	0	18,170	11,071	9,972,315
GENERAL CHEMICAL	4	17,096	498	0	17,594	7,541	86,652
MEDAL	3	13,061	0	0	13,061	147,630	2,648,000
GENERAL CLOTHING	1	12,000	0	0	12,000	0	0
AIR LIQUIDE AMERICA	1	11,740	0	0	11,740	0	0
D&B INDUSTRIAL GROUP	1	10,600	0	0	10,600	10,600	0
UNIQEMA	9	8,294	0	0	8,294	22,443	2,576
NORAMCO	7	7,942	0	0	7,942	1,413,700	0
AGRILINK FOODS	1	7,165	0	0	7,165	0	0
AGILENT TECHNOLOGIES	1	5,868	0	0	5,868	11,040	0
HARDCORE COMPOSITES	2	5,400	0	0	5,400	0	0
CITISTEEL	7	4,226	41	680	4,947	2,271,523	0
SPATZ FIBERGLASS	1	4,517	0	0	4,517	0	0
OCCIDENTAL CHEMICAL	4	4,018	21	0	4,039	14,314	3,816,860
RODEL TECHNICAL CENTER	3	4,004	0	0	4,004	37,233	0
JOHNSON POLYMER	6	3,372	0	0	3,372	3,699	2,090
ORIENT	3	3,085	0	0	3,085	1,292	10,271
AVECIA	6	2,967	0	0	2,967	264,764	473,776
SICO #360	9	2,392	0	0	2,392	0	0
MARBLE WORKS	1	2,269	0	0	2,269	0	0
ARLON	1	1,864	0	0	1,864	3,637	174,322
AMERICAN MINERALS	3	1,364	230	0	1,594	0	0
SPI POLYOLS	3	493	0	5	498	41,038	22,000

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TABLE 5, Continued
2000 FACILITY RANK BY ON-SITE RELEASES
 (IN POUNDS)

FACILITY	CHEMICALS REPORTED	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
		AIR	WATER	LAND	TOTAL		
VLASIC FOODS	2	418	0	0	418		0
GREEN TREE CHEMICAL	5	416	0	0	416	2,082	0
JOHNSON CONTROLS	2	266	0	0	266	4,287,028	0
FLAIR-NEW CASTLE	2	250	0	0	250	13,668	0
PPG INDUSTRIES	1	0	0	250	250	250	0
PPG ARCHITECTURAL FINISHES	4	83	0	0	83	2,584	0
E-A-R SPECIALTY COMPOSITES	2	70	0	0	70	0	0
PLAYTEX PRODUCTS	2	44	0	0	44	8,400	24,200
AMETEK	3	36	0	0	36	0	647
CLARIANT	1	5	0	0	5	709	0
KRAFT FOODS	1	5	0	0	5	4,968	24,820
GAC	2	2	0	0	2	1	0
ALLENS MILLING	3	0	0	0	0	0	0
BARCROFT	2	0	0	0	0	0	0
BLADES BULK PLANT	7	0	0	0	0	0	0
CARL KING	8	0	0	0	0	0	0
CHLORAMONE	1	0	0	0	0	0	0
CHROME DEPOSIT	2	0	0	0	0	7,100	3,000
HALKO	2	0	0	0	0	120,000	0
HERCULES RESEARCH CENTER	2	0	0	0	0	0	0
IKO PRODUCTION	1	0	0	0	0	65	0
INTERVET	1	0	0	0	0	29	0
MOUNTAIRE FARMS	3	0	0	0	0	0	0
MOUNTAIRE FEEDMILL	3	0	0	0	0	0	0
PERDUE BRIDGEVILLE	7	0	0	0	0	0	0
ROLLER SERVICE	1	0	0	0	0	0	0
SEAFORD BLEND	1	0	0	0	0	0	0
SERVICE ENERGY DOVER	7	0	0	0	0	0	0
SERVICE ENERGY MILFORD	2	0	0	0	0	0	0
TOTALS		7,840,007	866,312	1,103,632	9,809,951	20,118,694	124,688,794

Note: A "0" entry means that the value is either zero because the release was zero or the value was less than 0.5 pounds and rounded to zero. This entry in all columns for a chemical (Table 6) may mean that the chemical was reported on Form A, the short form. (Form A does not apply to PBT's).

On-Site Releases

On-site releases are emissions from a facility to the environment as a result of normal operations or accidents, including emissions to the air, discharges to surface water, disposal onto or into the ground, and underground injection. Underground injection is not an approved method of hazardous waste disposal in Delaware, and thus has not been reported by any facility in Delaware since reporting began. Although these releases are described as On-Site, some, particularly air and water, will leave the facility site and enter the off-site environment.

TABLE 6
2000 CHEMICAL RANK BY ON-SITE RELEASES
 (IN POUNDS)

CHEMICAL	FACILITIES REPORTING	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
		AIR	WATER	LAND	TOTAL		
HYDROCHLORIC ACID	8	4,270,982	0	0	4,270,982	0	29,657,944
SULFURIC ACID	7	1,001,635	0	0	1,001,635	0	594,654
NITRATE COMPOUNDS	5	0	753,368	210	753,578	60,051	950,000
VANADIUM COMPOUNDS	4	12,938	1,530	603,129	617,597	103,077	0
CERTAIN GLYCOL ETHERS	9	322,407	0	0	322,407	422,787	66,101
METHYL TERT-BUTYL ETHER	7	275,048	840	0	275,888	467	8,500,000
XYLENE (MIXED ISOMERS)	9	219,110	0	0	219,110	371,492	627,322
HYDROGEN FLUORIDE	3	217,552	0	0	217,552	0	110,357
NICKEL COMPOUNDS	6	10,329	2,294	182,559	195,182	102,478	0
CARBONYL SULFIDE	2	193,120	0	0	193,120	0	598,000
AMMONIA	14	180,607	3,874	0	184,481	122,174	9,144,850
BARIUM COMPOUNDS	3	8,737	2,737	141,356	152,830	139,709	0
VINYL CHLORIDE	2	149,170	1	0	149,171	4	446,875
N-HEXANE	10	143,984	0	0	143,984	62,028	1,658,000
N-BUTYL ALCOHOL	5	142,253	10	0	142,263	61,330	28,950
MANGANESE COMPOUNDS	11	4,128	42,868	37,681	84,677	3,319,213	0
CHROMIUM COMPOUNDS	8	5,890	2,097	75,449	83,436	292,453	3,000
METHANOL	10	82,314	1,000	0	83,314	5,173,884	13,459,015
ZINC COMPOUNDS	14	10,310	28,831	35,731	74,872	1,830,930	9,972,315
METHYL ETHYL KETONE	3	52,999	0	0	52,999	108,608	2,348,415
METHYL ISOBUTYL KETONE	2	50,800	0	0	50,800	287,171	0
STYRENE	7	50,698	0	0	50,698	3,206	240,094
BIPHENYL	2	40,311	0	0	40,311	289,977	2,262
COPPER COMPOUNDS	8	2,113	9,700	25,546	37,359	61,977	0
1,4-DICHLORO BENZENE	1	36,000	25	0	36,025	150,000	161,600
TOLUENE	13	28,172	0	0	28,172	313,097	1,255,200
N,N-DIMETHYLFORMAMIDE	2	26,757	0	0	26,757	969,560	4,368,907
ETHYLENE OXIDE	2	23,410	0	0	23,410	0	0
1,3-BUTADIENE	2	23,010	0	0	23,010	0	1,576,836
CHLORO BENZENE	1	22,600	5	0	22,605	54,000	271,700
N-METHYL-2-PYRROLIDONE	3	21,234	0	0	21,234	139,015	300
BENZENE	7	21,029	3	0	21,032	425	720,720
1,2,4-TRIMETHYLBENZENE	8	20,410	0	0	20,410	27,361	327,400
TRICHLOROETHYLENE	2	20,311	0	0	20,311	2,113	13,100,000
ETHYLBENZENE	6	18,410	0	3	18,413	26,123	99,000
ETHYLENE	2	17,089	0	0	17,089	0	9,400
VINYL ACETATE	2	15,771	0	0	15,771	7	848
ETHYLENE GLYCOL	7	13,026	290	0	13,316	58,996	29,000
SODIUM NITRITE	4	0	13,000	0	13,000	36,000	1,932,500
CYCLOHEXANE	5	12,259	0	0	12,259	6,306	163,979
1,2-DICHLORO BENZENE	1	12,100	19	0	12,119	45,000	302,100
CHLORODIFLUOROMETHANE	2	11,250	0	0	11,250	168	0
FORMALDEHYDE	4	8,665	0	0	8,665	9	7,500,000
1,2,4-TRICHLORO BENZENE	1	6,700	18	0	6,718	89,000	79,180
1,3-DICHLORO BENZENE	2	4,800	6	0	4,806	47,200	9,610
CHLORINE	6	3,779	0	0	3,779	780	9,922,180
ACRYLONITRILE	1	3,432	0	0	3,432	144	703,984
DIETHANOLAMINE	1	0	3,000	0	3,000	2	300,000
ANILINE	2	2,887	0	0	2,887	79,520	10,271
METHYL METHACRYLATE	2	2,465	0	0	2,465	104	1,391
MERCURY COMPOUNDS	7	477	0	108	585	272	0
DICHLOROMETHANE	1	2,210	0	0	2,210	300,900	0
MOLYBDENUM TRIOXIDE	1	6	0	1,520	1,526	0	0
4,4'-ISOPROPYLIDENE DIPHENOL	1	1,214	0	0	1,214	3,950	0
LEAD COMPOUNDS	4	1,118	42	35	1,195	4,586,092	0
PROPYLENE	1	1,161	0	0	1,161	0	61,000
ACRYLIC ACID	1	1,125	0	0	1,125	92	1
MERCURY	1	1,076	21	0	1,097	1,281	7,880
PROPYLENE OXIDE	1	942	0	0	942	0	0
BUTYL ACRYLATE	2	750	0	0	750	10	164

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TABLE 6, Continued
2000 CHEMICAL RANK BY ON-SITE RELEASES
 (IN POUNDS)

CHEMICAL	FACILITIES REPORTING	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
		AIR	WATER	LAND	TOTAL		
PHOSGENE	1	734	0	0	734	0	45,000
COBALT COMPOUNDS	2	705	41	0	746	32,262	0
NAPHTHALENE	3	713	1	0	714	1,499	4,957
POLYCYCLIC AROMATIC COMPOUNDS	10	555	7	0	562	66	1,070
ETHYL ACRYLATE	2	532	0	0	532	6	176
NICKEL	2	483	0	5	488	60,561	22,000
N-METHYLOLACRYLAMIDE	1	407	0	0	407	0	11
1,1-DICHLORO-1- FLUOROETHANE	1	404	0	0	404	0	0
ACETALDEHYDE	1	390	0	0	390	0	710,000
DIISOCYANATES	5	125	0	250	375	9,442	11,000
CHLOROFORM	1	362	0	0	362	12,253	0
PHENOL	3	92	270	0	362	1,020	115,865
FORMIC ACID	1	360	0	0	360	1,626	390,154
NITROBENZENE	1	217	0	0	217	2	0
BORON TRIFLUORIDE	1	215	0	0	215	929	0
ANTIMONY COMPOUNDS	2	100	0	50	150	15,897	0
BARIUM	1	20	109	0	129	0	0
CRESOL (MIXED ISOMERS)	1	0	120	0	120	19	52,000
LEAD	3	3	117	0	120	123,000	0
CUMENE	1	119	0	0	119	0	3,200
CUMENE HYDROPEROXIDE	1	106	0	0	106	0	0
TOLUENE DIISOCYANATE (MIXED ISOMERS)	2	80	0	0	80	0	973
NITRIC ACID	4	77	0	0	77	10,300	24,000
HEXACHLOROBENZENE	2	0	46	0	46	1,159	0
TITANIUM TETRACHLORIDE	1	44	0	0	44	0	1,953,000
1,3-DICHLOROPROPYLENE	1	30	0	0	30	20,597	0
TETRACHLOROETHYLENE	2	20	0	0	20	2,082	0
P-CHLOROANILINE	1	18	0	0	18	11,797	0
PENTACHLOROBENZENE	2	2	12	0	14	348	40
BIS(2-CHLOROETHYL) ETHER	1	11	0	0	11	6,460	0
BENZO (G,H,I) PERYLENE	8	0	10	0	10	0	1,001
CARBON DISULFIDE	1	3	0	0	3	0	31,042
DIOXIN AND DIOXIN-LIKE COMPOUNDS *	8	0.0117	0.0308	0.0025	0.0450	86.8935	0.0000
1-(3-CHLOROALLYL)-3,5,7- TRIAZA-1-AZONIAADAMANTANE CHLORIDE	1	0	0	0	0	0	0
4,4'-METHYLENEBIS (2-CHLOROANILINE)	1	0	0	0	0	0	0
ANTIMONY	1	0	0	0	0	0	0
ARSENIC COMPOUNDS	1	0	0	0	0	0	0
ASBESTOS (FRIABLE)	1	0	0	0	0	0	0
CHLOROETHANE	1	0	0	0	0	0	0
CHROMIUM	1	0	0	0	0	32,940	0
COPPER	1	0	0	0	0	13,500	0
DI(2-ETHYLHEXYL) PHTHALATE	1	0	0	0	0	0	0
DIETHYL SULFATE	1	0	0	0	0	0	0
MANGANESE	1	0	0	0	0	8,474	0
OCTACHLOROSTYRENE	1	0	0	0	0	437	0
PHTHALIC ANHYDRIDE	1	0	0	0	0	0	0
POLYCHLORINATED BIPHENYLS	4	0	0	0	0	1,388	0
TETRABROMOBIPHENOL A	1	0	0	0	0	0	0
TOTALS		7,840,007	866,312	1,103,632	9,809,951	20,118,694	124,688,794

* Dioxins are reported in grams and were converted to pounds for this report

Releases to Air

Table 6 presents a listing of the TRI chemicals reported in 2000. As a result of the addition of power plants in 1998, the top chemicals with on-site air releases are the result of the combustion of coal. The top four facilities operate on-site power generation units that burn coal or coke (Motiva Enterprises) and consequently have large acid gas (hydrochloric acid, sulfuric acid, and hydrogen fluoride) emissions. Coal contains small amounts of chlorine-, fluorine-, and sulfur-containing compounds that, through the combustion process, are converted to these acids. These four facilities alone account for 70% of the air releases within the state and 72% of the total statewide on-site releases.

The chemical with the third largest on-site air release is glycol ethers, which was reported as being released to the air by nine facilities. A primary use of glycol ethers is as a solvent in paints and for parts cleaning. The automobile manufacturing industry represents over 90% of the state TRI-reported glycol ethers released to air.

Releases to Water

As can be seen in Tables 5 and 6, there are far fewer TRI releases to water than to air. Nitrate compounds were the top chemicals released to Delaware's surface waters followed by manganese compounds and zinc compounds. Nitrates are formed through the biological treatment of ammonia and other nitrogen-containing compounds and were primarily reported as being released to the Nanticoke River by DuPont Seaford and to the Savannah Ditch by Perdue Georgetown. Nitrates are a nutrient, and in excessive amounts they contribute to eutrophication in the aquatic environment. Of the total water releases, 87% were nitrates.

Manganese compounds were reported as being released to water by five facilities, with DuPont Edge Moor and the Edge Moor power plant contributing over 99% of the total water release of manganese compounds. DuPont produces manganese compounds as a result of impurities in the ore extraction process, and power plants produce manganese as a result of impurities in their fuel.

Zinc compounds were reported as being released to Delaware waters by six facilities. The NVF Yorklyn Complex uses zinc chloride as a catalyst in the process of manufacturing vulcanized paper, and releases zinc to the Red Clay Creek. The Indian River Power Plant reported the release of zinc compounds to the Indian River. Zinc is found as an impurity in coal, and zinc compounds (usually zinc oxide) are formed during the combustion of the coal. These facilities contributed 90% of the zinc releases to water.

Releases to Land

Nearly all reported releases to land were of metals and metal compounds. Land releases reported by Indian River Power Plant and Motiva Enterprises accounted for over 99% of the reported statewide releases to land.

Vanadium compounds are new to the TRI reporting list for 2000 and constitute 94% of the land release increase over 1999 data and 54% of the total land releases for 2000. Motiva contributed 89% of the total vanadium release. Vanadium is a metal and is an impurity in their feed stock crude oil. Vanadium compounds are formed in the distillation process as coke is formed and combusted. Coke is a solid product (like coal) that is generated from the heaviest hydrocarbons present in crude oil. Coke is a fuel and is burned at the Motiva Enterprises power plant. The Indian River Power Plant also reported vanadium compounds. Vanadium is an impurity in their fuel. Nickel and barium compounds rank second and third in land releases and their formation is similar to that for vanadium. These impurities in the fuel are converted to nickel and barium compounds in the combustion process. The Indian River power plant, Motiva, and DuPont Edge Moor produced the majority of nickel and barium compounds. These compounds in the fly ash that is captured by pollution control equipment are sent to on-site landfill or a surface impoundment. Nickel oxide in the bottom ash and slag is also sent to on-site landfills.

Off-site Transfers

Tables 5 and 6 on pages 6-9 also show the totals for waste that was reported as being transferred off-site to other facilities for further waste management. Over half of all transfers were sent off-site for energy recovery or to be recycled. Table 3 on page 5 provides a breakdown of the total for the various methods used to handle the wastes. Wastes sent off-site are transported via roads, railways, and pipelines, through neighboring communities, to other facilities within and outside Delaware. When processed at these facilities, some of the chemicals in the wastes may later be released to the environment by the receiving facility. Although many disposals are classified as off-site transfers, some, particularly disposal to landfill, may be expected to never leave the disposal site and enter the off-site environment.

Twenty four percent of all TRI chemicals transferred off-site as wastes were sent to another facility in Delaware, with nearly all of these intra-state transfers being sent to the Wilmington wastewater treatment plant (WWTP). The remaining 76% of TRI chemicals sent off-site in wastes were transferred out of Delaware to 20 different states, including sites as far away as Arizona, Texas, and Utah. TRI reports from out-of-state facilities are not sent to DNREC, thus data on waste sent to Delaware facilities by out-of-state facilities must be obtained from EPA. Most facilities in Delaware that receive TRI reported waste from other facilities are themselves not required to report under TRI.

On-Site Waste Management

As reported under TRI, the combined amount of a TRI chemical in waste generated and managed on-site through recycling, energy recovery, and treatment represents the total amount of on-site waste. These are wastes that never leave the site. As can be seen in Tables 5 and 6, the majority (80%) of TRI chemicals in waste never leaves the facility, but rather are managed on-site. Recycled waste is the quantity of the toxic material recovered at the facility and made available for further use. Energy recovery includes the quantity of toxic material that was combusted in some form of energy recovery device, such as a furnace. The waste treatment segment includes the amount of toxic material that was destroyed in on-site waste treatment operations.

TABLE 6A
2000 FACILITY RANK BY TOTAL WASTE
(IN POUNDS)

FACILITY	CHEMICALS REPORTED	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.	TOTAL WASTE
		AIR	WATER	LAND	TOTAL			
MOTIVA ENTERPRISES	39	1,007,060	25,630	723,063	1,755,753	79,616	44,865,163	46,700,532
DU PONT EDGE MOOR	20	199,289	29,299	0	228,588	3,467,214	37,208,000	40,903,802
CAMDEL METALS	4	20,311	0	0	20,311	64,950	13,100,000	13,185,261
NVF YORKLYN	1	0	18,170	0	18,170	11,071	9,972,315	10,001,556
RODEL	5	37,426	0	0	37,426	967,678	4,652,027	5,657,131
CIBA SPECIALTY CHEMICALS	6	33,762	0	0	33,762	4,846,738	262,671	5,143,171
JOHNSON CONTROLS	2	266	0	0	266	4,287,028	0	4,287,294
OCCIDENTAL CHEMICAL	4	4,018	21	0	4,039	14,314	3,816,860	3,835,213
INDIAN RIVER POWER PLANT	15	2,647,969	14,796	379,166	3,041,931	4,773	424,799	3,471,503
MEDAL	3	13,061	0	0	13,061	147,630	2,648,000	2,808,691
REICHOLD INC.	12	39,611	0	0	39,611	2,968	2,518,941	2,561,520
EDGE MOOR/HAY ROAD POWER PLANTS	15	1,845,441	23,137	0	1,868,578	322,395	146,560	2,337,533
CITISTEEL	7	4,226	41	680	4,947	2,271,523	0	2,276,470
MACDERMID	3	31,907	0	0	31,907	106,095	2,078,635	2,216,637
METACHEM PRODUCTS	12	97,154	81	0	97,235	383,299	992,950	1,473,484
NORAMCO	7	7,942	0	0	7,942	1,413,700	0	1,421,642
DU PONT SEAFORD	13	373,421	427,600	258	801,279	1,040	426,000	1,228,319
DANMLERCHRYSLER	20	483,604	0	0	483,604	596,690	61,500	1,141,794
GENERAL MOTORS	11	278,115	0	0	278,115	471,441	73,200	822,756
AVECIA	6	2,967	0	0	2,967	264,764	473,776	741,507
KANEKA	2	35,449	1	0	35,450	4	457,992	493,446
PERDUE GEORGETOWN	4	0	326,808	210	327,018	0	0	327,018
FORMOSA PLASTICS	4	134,526	0	0	134,526	0	158,827	293,353
ARLON	1	1,864	0	0	1,864	3,637	174,322	179,823
NRG ENERGY CENTER DOVER	3	152,979	0	0	152,979	3	0	152,982
TOWNSENDS	1	121,947	0	0	121,947	0	0	121,947
HALKO	2	0	0	0	0	120,000	0	120,000
HONEYWELL	6	23,249	0	0	23,249	94,808	0	118,057
GENERAL CHEMICAL	4	17,096	498	0	17,594	7,541	86,652	111,787
SPI POLYOLS	3	493	0	5	498	41,038	22,000	63,536
RODEL TECHNICAL CENTER	3	4,004	0	0	4,004	37,233	0	41,237
JUSTIN TANKS	1	34,512	0	0	34,512	573	0	35,085
SUNOCO, INC. (R&M) - MARCUS HOOK	2	34,270	0	0	34,270	0	0	34,270
UNIQEMA	9	8,294	0	0	8,294	22,443	2,576	33,313
PLAYTEX PRODUCTS	2	44	0	0	44	8,400	24,200	32,644
KRAFT FOODS	1	5	0	0	5	4,968	24,820	29,793
HIRSH INDUSTRIES	2	29,457	0	0	29,457	0	0	29,457
HANOVER FOODS	1	24,000	0	0	24,000	0	0	24,000
D&B INDUSTRIAL GROUP	1	10,600	0	0	10,600	10,600	0	21,200
NANTICOKE HOMES	3	19,216	0	0	19,216	0	0	19,216
AGILENT TECHNOLOGIES	1	5,868	0	0	5,868	11,040	0	16,908
ORIENT	3	3,085	0	0	3,085	1,292	10,271	14,648
FLAIR-NEW CASTLE	2	250	0	0	250	13,668	0	13,918
GENERAL CLOTHING	1	12,000	0	0	12,000	0	0	12,000
AIR LIQUIDE AMERICA	1	11,740	0	0	11,740	0	0	11,740
CHROME DEPOSIT	2	0	0	0	0	7,100	3,000	10,100
JOHNSON POLYMER	6	3,372	0	0	3,372	3,699	2,090	9,161
AGRILINK FOODS	1	7,165	0	0	7,165	0	0	7,165
HARDCORE COMPOSITES	2	5,400	0	0	5,400	0	0	5,400
SPATZ FIBERGLASS	1	4,517	0	0	4,517	0	0	4,517
PPG ARCHITECTURAL FINISHES	4	83	0	0	83	2,584	0	2,667
GREEN TREE CHEMICAL	5	416	0	0	416	2,082	0	2,498
SICO #360	9	2,392	0	0	2,392	0	0	2,392
MARBLE WORKS	1	2,269	0	0	2,269	0	0	2,269

Continued on next page

TABLE 6A, Continued
2000 FACILITY RANK BY TOTAL WASTE
(IN POUNDS)

FACILITY	CHEMICALS REPORTED	ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.	TOTAL WASTE
		AIR	WATER	LAND	TOTAL			
AMERICAN MINERALS	3	1,364	230	0	1,594	0	0	1,594
CLARIANT	1	5	0	0	5	709	0	714
AMETEK	3	36	0	0	36	0	647	683
PPG INDUSTRIES	1	0	0	250	250	250	0	500
VLASIC FOODS	2	418	0	0	418	0	0	418
E-A-R SPECIALTY COMPOSITES	2	70	0	0	70	0	0	70
IKO PRODUCTION	1	0	0	0	0	65	0	65
INTERVET	1	0	0	0	0	29	0	29
GAC	2	2	0	0	2	1	0	3
ALLENS MILLING	3	0	0	0	0	0	0	0
BARCROFT	2	0	0	0	0	0	0	0
BLADES BULK PLANT	7	0	0	0	0	0	0	0
CARL KING	8	0	0	0	0	0	0	0
CHLORAMONE	1	0	0	0	0	0	0	0
HERCULES RESEARCH CENTER	2	0	0	0	0	0	0	0
MOUNTAIRE FARMS	3	0	0	0	0	0	0	0
MOUNTAIRE FEEDMILL	3	0	0	0	0	0	0	0
PERDUE BRIDGEVILLE	7	0	0	0	0	0	0	0
ROLLER SERVICE	1	0	0	0	0	0	0	0
SEAFORD BLEND	1	0	0	0	0	0	0	0
SERVICE ENERGY DOVER	7	0	0	0	0	0	0	0
SERVICE ENERGY MILFORD	2	0	0	0	0	0	0	0
TOTALS		7,840,007	866,312	1,103,632	9,809,951	20,118,694	124,688,794	154,617,439

Total Waste

Total waste is the sum of the on-site releases, off-site transfers, and on-site waste. This amount is shown in Table 6A above. It is Table 5 with the addition of the Total Waste column and the facility ranking is based on that column.

PBT Data

Persistent Bioaccumulative Toxics (PBT's) are becoming increasingly important as we learn more about them. Reporting of PBT's is also being emphasized to an increasing degree. In an October 29, 1999 ruling, the EPA established substantially lower reporting thresholds for 15 chemicals and three chemical categories that are highly persistent and bioaccumulative in the environment. These chemicals are of particular concern not only because they are toxic but also because they remain in the environment for long periods of time, are not readily destroyed, and build up and accumulate in body tissues. Relatively small releases of PBT chemicals can pose human and environmental health threats and consequently releases of these chemicals warrant recognition by communities. EPA believes that the prior thresholds of 25,000 pounds for the manufacture or processing of a chemical and 10,000 pounds for "otherwise use" of chemicals excluded important information on these PBT chemicals.

Thus, not all of the PBT chemicals were reportable under the previous guidelines, and the thresholds for PBT chemicals were lowered to the levels shown in Table 2 on page 3. Also, for the reporting year 2000 and later the EPA added two chemical categories and six chemicals to an existing category.

Table 7 shows the values of all releases, transfers, and waste compared to those of the PBT's. Twenty-three facilities submitted 51 reports on 12 PBT chemicals. Over 98% of the PBT's were sent off site for recycling. Lead recycled by Johnson Controls made up most of the recycled PBT's. On-site releases totaled 5,453 pounds. The largest contributor to on-site release of PBT's was the Occidental Chemical facility with 1,076 pounds of mercury released to air.

Table 8 shows the amounts of each PBT chemical released by each reporting facility in the state. The chemicals are ranked alphabetically.

TABLE 7
2000 TRI PBT DATA SUMMARY
(IN POUNDS)

	All Data	PBT's only
No. of facilities	76	23
No. of Form A's	61	0
No. of Form R's	302	51
No. of Chemicals	108	12
On-site Releases		
Air	7,840,007	3,231
Water	866,312	255
Land	1,103,632	143
Total Releases	9,809,951	3,629
Off-site Transfers		
POTW's	2,199,807	772
Recycle	8,491,115	4,660,197
Energy Recovery	2,539,369	0
Treatment	3,073,791	1,202
Disposal	3,814,612	51,959
Total Transfers	20,118,694	4,714,130
On-site Waste Mgmt.		
Recycle	31,188,694	7,920
Energy Recovery	29,095,221	371
Treatment	64,404,879	1,700
Total on-site Mgmt.	124,688,794	9,991
Total Waste	154,617,439	4,727,750

TABLE 8
2000 PBT RELEASES BY CHEMICAL AND FACILITY
(in pounds)

	TOTAL ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
	AIR	WATER	LAND	TOTAL		
BENZO (G,H,I) PERYLENE						
DU PONT SEAFORD	0	0	0	0	0	0
EDGE MOOR POWER PLANT	0	0	0	0	0	0
HERCULES	0	0	0	0	0	0
INDIAN RIVER POWER PLANT	0	0	0	0	0	0
MOTIVA	0	10	0	10	0	1,001
PERDUE BRIDGEVILLE	0	0	0	0	0	0
PERDUE GEORGETOWN	0	0	0	0	0	0
VLASIC FOODS	0	0	0	0	0	0
CHEMICAL TOTAL	0	10	0	10	0	1,001
DIOXIN AND DIOXIN-LIKE COMPOUNDS						
DU PONT EDGE MOOR	0.0002	0.0308	0.0000	0.0311	85.2356	0
DU PONT SEAFORD	0.0004	0.0000	0.0021	0.0025	0.0000	0
EDGE MOOR POWER PLANT	0.0028	0.0000	0.0000	0.0028	0.0000	0
FORMOSA PLASTICS	0.0000	0.0000	0.0000	0.0000	0.0008	0
INDIAN RIVER POWER PLANT	0.0029	0.0000	0.0000	0.0029	0.0000	0
METACHEM	0.0000	0.0000	0.0000	0.0000	1.6535	0
MOTIVA	0.0053	0.0000	0.0004	0.0057	0.0000	0
OCCIDENTAL CHEMICAL	0.0000	0.0000	0.0000	0.0000	0.0000	0
CHEMICAL TOTAL	0.0117	0.0308	0.0025	0.0450	86.8898	0
HEXACHLOROBENZENE						
DU PONT EDGE MOOR	0	41	0	41	1,159	0
METACHEM	0	5	0	5	0	0
CHEMICAL TOTAL	0	46	0	46	1,159	0

Dioxins are reported in grams and were converted to pounds for this report

Continued on next page

TABLE 8, Continued
2000 PBT RELEASES BY CHEMICAL AND FACILITY
(in pounds)

CHEMICAL FACILITY	TOTAL ON-SITE RELEASES				OFF-SITE TRANSFERS	ON-SITE WASTE MGMT.
	AIR	WATER	LAND	TOTAL		
LEAD						
AMERICAN MINERALS	3	117	0	120	0	0
CHROME DEPOSIT	0	0	0	0	3,000	0
HALKO	0	0	0	0	120,000	0
CHEMICAL TOTAL	3	117	0	120	123,000	
LEAD COMPOUNDS						
CITISTEEL	602	4	35	641	266,086	0
DU PONT EDGE MOOR	0	38	0	38	46,550	0
GENERAL CHEMICAL	250	0	0	250	2,325	0
JOHNSON CONTROLS	266	0	0	266	4,271,131	0
CHEMICAL TOTAL	1,118	42	35	1,195	4,586,092	
MERCURY						
OCCIDENTAL CHEMICAL	1,076	21	0	1,097	1,281	7,880
CHEMICAL TOTAL	1,076	21	0	1,097	1,281	7,880
MERCURY COMPOUNDS						
CITISTEEL	33	0	0	33	0	0
DU PONT SEAFORD	21	0	18	39	0	0
EDGE MOOR POWER PLANT	138	0	0	138	237	0
INDIAN RIVER POWER PLANT	230	0	90	320	2	0
INTERVET	0	0	0	0	29	0
MOTIVA	19	0	0	19	1	0
NRG ENERGY DOVER	36	0	0	36	3	0
CHEMICAL TOTAL	477	0	108	585	272	0
OCTACHLOROSTYRENE						
DU PONT EDGE MOOR	0	0	0	0	437	0
CHEMICAL TOTAL	0	0	0	0	437	
PENTACHLOROBENZENE						
DU PONT EDGE MOOR	0	12	0	12	348	0
METACHEM	2	0	0	2	0	40
CHEMICAL TOTAL	2	12	0	14	348	40
POLYCHLORINATED BIPHENYLS						
DU PONT EDGE MOOR	0	0	0	0	188	0
METACHEM	0	0	0	0	1,200	0
PERDUE BRIDGEVILLE	0	0	0	0	0	0
PERDUE GEORGETOWN	0	0	0	0	0	0
CHEMICAL TOTAL	0	0	0	0	1,388	0
POLYCYCLIC AROMATIC COMPOUNDS						
DU PONT SEAFORD	0	0	0	0	0	0
EDGE MOOR POWER PLANT	40	0	0	40	0	0
GARDNER ASPHALT	2	0	0	2	1	0
HERCULES	0	0	0	0	0	0
IKO PRODUCTION	0	0	0	0	65	0
INDIAN RIVER POWER PLANT	88	0	0	88	0	0
MOTIVA	7	7	0	14	0	1,070
PERDUE BRIDGEVILLE	0	0	0	0	0	0
PERDUE GEORGETOWN	0	0	0	0	0	0
VLASIC FOODS	418	0	0	418	0	0
CHEMICAL TOTAL	555	7	0	562	66	1,070
TETRABROMOBISPHENOL A						
AMETEK	0	0	0	0	0	0
CHEMICAL TOTAL	0	0	0	0	0	0
TOTALS	3,231	255	143	3,629	4,714,130	9,991

NATIONAL PERSPECTIVE

The national 2000 TRI report, issued by the U.S. Environmental Protection Agency (EPA) on May 23, 2002 shows Delaware ranked 44th in total on-site releases for all TRI chemicals, 43rd for on-site PBT chemical releases, and 33rd for on-site releases of Dioxins only, for the 56 states and territories reporting. Considering total on-site releases, 82 facilities in the nation each individually released more than all Delaware facilities combined. Sixty facilities in the nation each released more on- and off-site than the entire state of Delaware. The top facility in the nation released on-site nearly 83 times and off-site nearly 60 times more TRI reportable chemicals than reported by all of the facilities in Delaware combined.

However, some Delaware facilities do rank at or near the top of the nation for specific releases. Formosa Plastics ranks 1st in the nation for total on-site release of vinyl chloride (114,043 pounds). Motiva ranks 1st in the nation for total on-site release of methyl tert-butyl ether (MTBE) (272,840 pounds). DuPont Edge Moor ranks 1st in the nation for off-site release of dioxins (85.24 pounds). Although this amount places the state of Delaware in 1st place based on total off-site dioxin releases, on-site Dioxin releases rank the facility at 59th in the nation and the State at 33rd. The top national on-site facility release for Dioxins was about 970 times the entire state of Delaware on-site release. Occidental Chemical ranks 14th in the nation for total on-site release of mercury (1,097 pounds), and 7th for air only release.

For definitions of on-site and off-site releases see pages 7-11. Off-site releases/disposals fall into 10 categories, encompassing land application, land treatment, and landfill, storage, stabilization, transfer to waste brokers for disposal, and other waste management.

The Indian River Power Plant initially reported a release to land of mercury compounds in the amount of 1,914 pounds, ranking it 39th in the nation. Later, an error in calculation was found, reducing the total to 90 pounds and placing it well down the list of 1,028 facilities in the nation reporting release of mercury compounds. The corrected values are part of this report where they apply, but the EPA national TRI data has not been corrected as of July 2002.

TREND ANALYSES

Although TRI data is available back to 1987, changes in the reporting requirements through the years require adjustments to provide a comparison based on consistent reporting. Two of the most significant changes to TRI reporting include the addition of a large number of chemicals in 1995 and the expansion to include additional industry types in 1998. Based on these significant changes, this report will present trend analyses using two different base years.

The first analysis utilizes 1995 as the base year. The data for this analysis is presented in Table 9. Since 1995, relatively few changes to the TRI list of chemicals have occurred, although some were added in 2000 as noted on page 3. The 1995 to 2000 analysis excludes data from the new industries added in 1998 and the new chemicals added for 2000. This analysis allows the user to determine what long-term progress has been made by Delaware facilities for a consistently reportable list of chemicals over the past six years.

The second analysis utilizes 1998 as the base year. The data for this analysis is presented in Table 10. The 1998 to 2000 analysis excludes data for chemicals that were added or modified since 1998, including those added for 2000.

When evaluating trends in TRI data, it is important to consider the various factors that could result in changes to TRI data reported by facilities. Changes in reported amounts from one year to the next may be the result of changes in the level of production at facilities, source reduction activities, changes in processes, or the installation of better pollution controls. Other changes may result from the availability of new information, the use of different calculation methods, or a change in reporting requirements, and thus may not represent true change in releases. Furthermore, releases and waste management activities resulting from remedial actions, catastrophic events, or one-time events not associated with production processes can also affect the totals. Interested individuals are encouraged to contact facilities and inquire as to the reasons why changes occurred. A listing of facilities and contacts is provided in appendix B.

Table 9 shows the trends of on-site releases, off-site transfers, and on-site waste management from manufacturing facilities since 1995. This table includes data from the 1995 chemical list expansion and chemical modifications, such as hydrochloric and sulfuric acids, which were qualified to include aerosol forms only. This table does not include chemicals or facilities added or deleted since 1995.

TABLE 9
1995-2000 TRI DATA SUMMARY
(IN POUNDS)

ADJUSTED FOR CHANGES IN REPORTING REQUIREMENTS

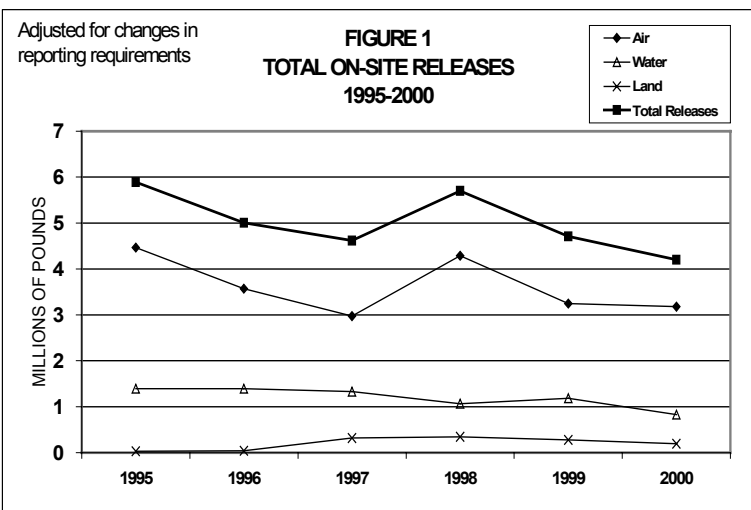
	1995	1996	1997	1998	1999	2000
No. of facilities	73	75	73	70	66	67
No. of Form A's	28	34	29	30	32	31
No. of Form R's	221	212	237	240	231	241
No. of Chemicals	87	94	98	103	98	101
On-site Releases						
Air	4,466,247	3,569,898	2,973,704	4,286,623	3,246,226	3,178,779
Water	1,394,739	1,395,328	1,328,937	1,066,787	1,186,039	826,597
Land	28,678	42,409	317,243	347,129	278,319	194,448
Total Releases	5,889,664	5,007,635	4,619,884	5,700,539	4,710,584	4,199,824
Off-site Transfers						
POTW's	3,270,795	4,564,126	4,354,090	3,334,189	2,996,375	2,199,732
Recycle	17,127,835	10,054,483	10,544,518	11,963,716	9,295,315	8,454,588
Energy Recovery	2,427,102	1,173,331	1,663,440	1,491,543	1,389,936	2,539,369
Treatment	897,090	1,277,004	675,561	611,696	894,822	3,073,789
Disposal	2,767,339	2,905,928	4,010,594	3,719,902	2,985,340	3,471,837
Total Transfers	26,490,161	19,974,872	21,248,203	21,121,046	17,561,788	19,739,315
On-site Waste Mgmt.						
Recycle	29,100,208	29,882,121	32,996,062	34,549,050	32,671,856	31,188,654
Energy Recovery	332,834	219,184	19,255,280	16,155,665	22,981,591	29,095,220
Treatment	55,811,179	51,424,487	68,575,887	67,199,660	69,149,944	63,832,520
Total on-site Mgmt.	85,244,221	81,525,792	120,827,229	117,904,375	124,803,391	124,116,394
Total Waste	117,624,046	106,508,299	146,695,316	144,725,960	147,075,763	148,055,533

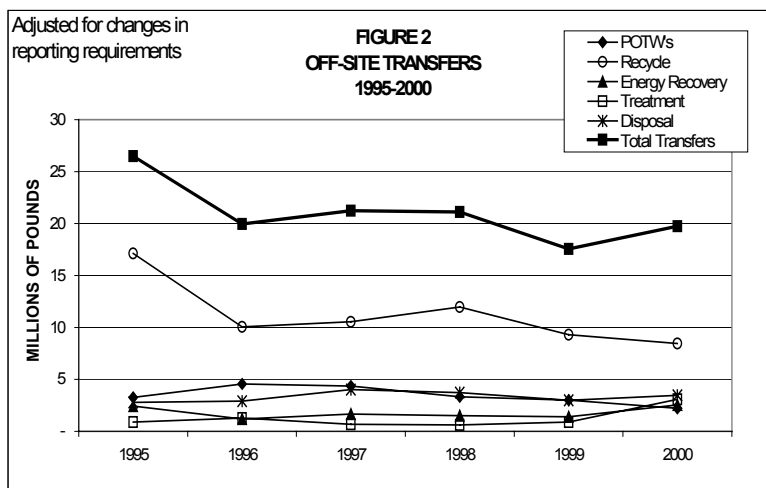
Reporting Years 1995-2000

Figure 1 presents the trend of on-site air, water, and land releases from manufacturing facilities since 1995, adjusted for the 1995 reporting basis.

Overall, statewide on-site releases decreased by 10.8% from 1999 to 2000, and decreased by 28.7% from 1995 to 2000. Total on-site releases for 2000 are more than 10% below the previous low reported in 1997. This decrease is largely due to decreased amounts of several chemicals including nitrate compounds, hydrochloric acid, xylene, and N-hexane, but was partially offset by increases in reporting for sulfuric acid, methyl tert-butyl ether, certain glycol ethers, and nickel compounds.

From 1997 to 1998, on-site releases increased by 23%. This was due for the most part to the large increase in sulfuric acid releases reported by Motiva Enterprises and the increased air





releases reported by Daimler Chrysler. Air releases are the primary driving force behind the year-to-year changes in total on-site releases.

Figure 2 presents the trends of off-site transfers. Off-site transfers decreased by 6.8 million pounds during this time, a 25% reduction. Reductions in transfers to POTW's (Publicly Owned Treatment Works) and to recycling were partially offset by increases in transfers to treatment and disposal. The

total adjusted trend has been generally declining over the past several years. However, in 2000 the trend reversed, and was driven by increases in treatment and energy recovery, as off-site recycle and transfers to POTW's continued to decline.

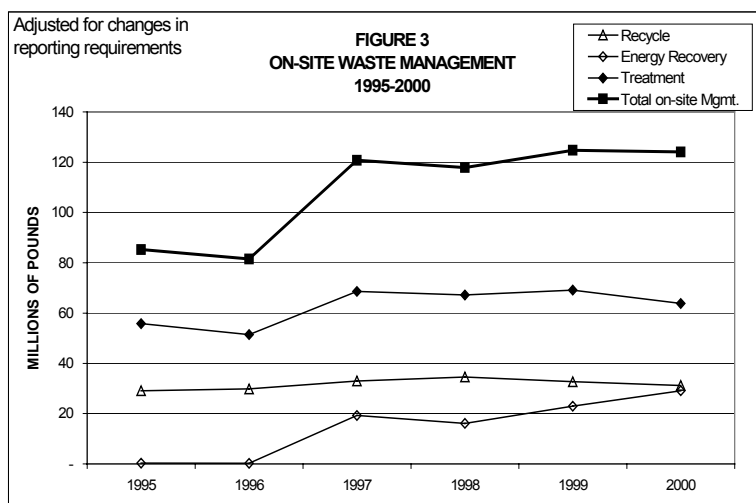


Figure 3 presents the trends of 1995-2000 on-site waste management. There was a strong upward trend in 1997, driven by on-site treatment and energy recovery reports. In 1997, on-site treatment increased by more than 17 million pounds, largely due to a 16 million pound change in reporting of methanol, and energy recovery increased by 17 million pounds for ammonia, both reported by Motiva. In 1996 Motiva reported less than 300,000 pounds for all chemicals for the on-site waste

management area. This increase was the result of new data and changes in calculating methods.

In 2000, Motiva continued to drive the energy recovery category, reporting a 6 million pound increase, offsetting decreases in other waste management areas. The on-site waste management trend has reached a plateau with the exception of energy recovery, which continues upward.

Figure 4 combines the totals from the previous three graphs and illustrates the trend of statewide total waste since 1995. While on-site releases have decreased by 29% and off-site transfers have decreased by 26%, on-site waste management has increased 46% and total waste has increased by 26% over the 1995-2000 time period. Again, one category drives the

total trend. The on-site waste management category, being the largest, greatly influences the total. Following the large increase previously discussed on page 16, recent year-to-year changes have been relatively small, increasing 0.9% from 1997 to 2000. Although changes in individual category values are typically driven by a significant change in reporting by a few facilities each year, these are usually balanced by offsetting changes in other categories. For example, from 1999 to 2000, the amount of TRI chemicals in wastes treated off-site increased by 2.2 million pounds largely because the Ciba Specialty Chemical facility, which had reported off-site treatment of 64,101 pounds of methanol in 1999, reported 1,540,896 pounds in 2000, an increase of 1,476,795 pounds. However, Ciba reported that amounts of methanol sent to Publicly Owned Treatment Works (POTW's) decreased in 2000 to 1,245,943 pounds from the 2,063,503 pounds reported in 1999, a decrease of 817,560 pounds.

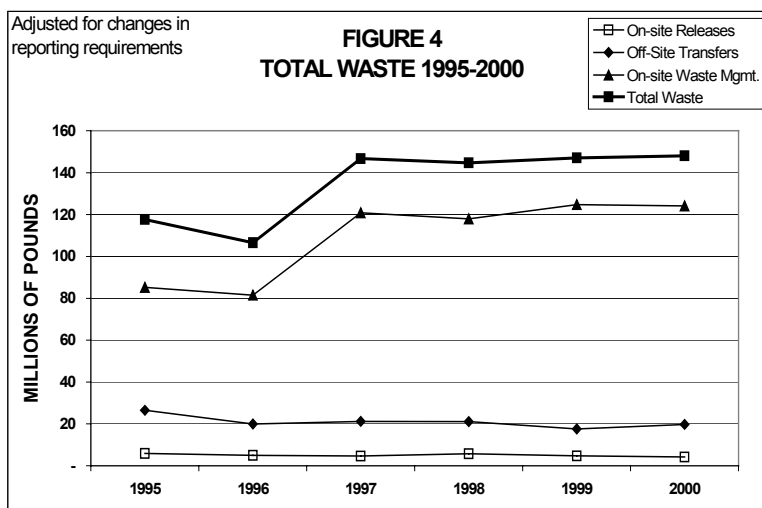


TABLE 10
1998-2000 TRI DATA SUMMARY
(IN POUNDS)

Adjusted for changes in reporting requirements

	1998	1999	2000
No. of facilities	79	76	76
No. of Form A's	70	72	61
No. of Form R's	271	254	278
No. of Chemicals	105	101	102
On-site Releases			
Air	9,787,574	6,651,166	7,826,590
Water	1,126,527	1,197,861	864,760
Land	937,708	462,579	500,395
Total Releases	11,851,809	8,311,606	9,191,745
Off-site Transfers			
POTWs	3,334,297	2,996,401	2,199,804
Recycle	11,963,926	9,295,315	8,491,112
Energy Recovery	1,491,543	1,389,936	2,539,369
Treatment	611,996	894,822	3,073,789
Disposal	3,983,506	3,056,466	3,710,399
Total Transfers	21,385,268	17,632,940	20,014,473
On-site Waste Mgmt.			
Recycle	34,549,050	32,671,856	31,188,654
Energy Recovery	16,155,665	22,981,591	29,095,220
Treatment	68,126,327	69,501,151	64,403,879
Total on-site Mgmt.	118,831,042	125,154,598	124,687,753
Total Waste	152,068,119	151,099,144	153,893,971

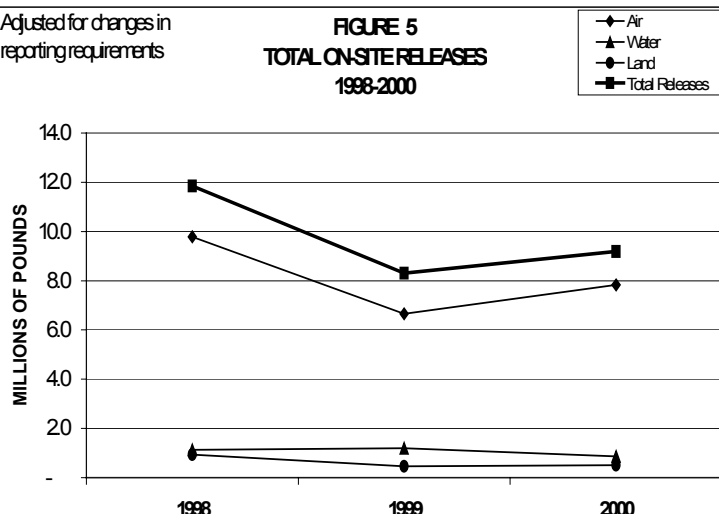
Reporting Years 1998-2000

The second trend analysis time period is 1998-2000. New industry segments as noted on page 3 were added in 1998, and they are included here.

Table 10 shows data for on-site releases since 1998, and is graphically illustrated in Figure 5 below. Off-Site Transfers, On-Site Waste Management, and Total Waste follow on pages 22-23 in figures 6, 7, and 8. The basis for this table and graphs is different from the 1995-2000 data above because of the addition of new facilities in 1998. Those facilities are included in the 1998-2000 trend analysis, but excluded from the 1995-2000 trend analysis. New chemicals reportable for the first time in 2000, along with PBT chemicals not reported by a facility because of the previous higher thresholds, are also not included in this 1998-2000 data. Likewise, chemicals delisted in this time period are also not reported. Reported on-site releases of consistently-reportable chemicals in this time period decreased by 22% since 1998.

Adjusted for changes in reporting requirements

FIGURE 5
TOTAL ON-SITE RELEASES
1998-2000



While a decrease in releases has been achieved from 1998 to 2000 and from 1995 to 2000, reported releases increased 10.6% from 1999 to 2000. The primary cause of the increase is due to the 17.7% (1,175,424 pounds) increase in air releases, partially offset by the 333,101-pound decrease in water releases. Again, air releases dominate the year-to-year changes.

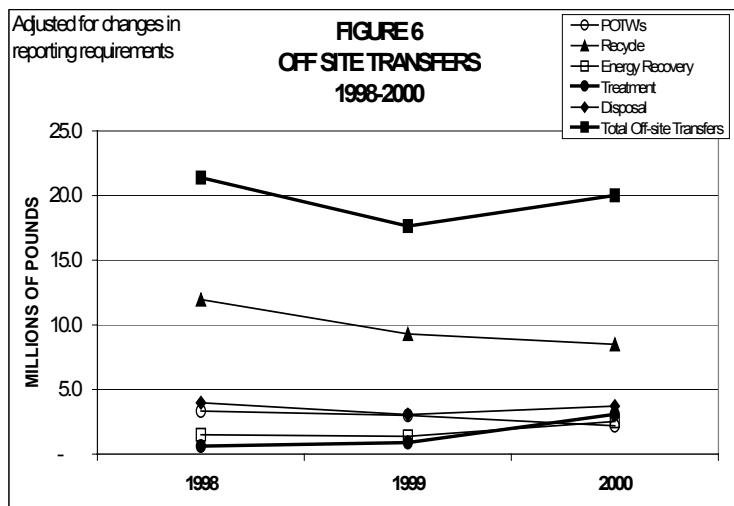
The Indian River power plant had a production increase of 29% which accounts for all of its air release increase of 547,683 pounds and most of its total increase of 675,158 pounds. Their land release also increased by 121,687 pounds, primarily due to increased metallic compound reporting. This increased reporting was a result of increased coal use and changing analysis methods to sample coal for TRI compounds instead of using standard values.

The Edge Moor power plant increased coal use and decreased #6 oil use in 2000, resulting in an increase of 735,397 pounds in total on-site releases, consisting mostly of an increase of 715,068 pounds air releases. Again, analytical methods for coal were changed, and both power plants reported chemicals (ammonia, cobalt compounds, and PAC's) that fell above their reporting thresholds for the first time in 2000.

Motiva Enterprises reported an increase of 193,134 pounds in total on-site releases. Releases to air increased by 260,526 pounds, but were partially offset by reductions in release to land of 70,158 pounds. Releases to water increased by 2,766 pounds. The primary contributors to the increases in the releases to air were methyl tert-butyl ether (MTBE), increasing by 224,500 pounds, and sulfuric acid gas, increasing by 210,000 pounds. These were partially offset by reductions reported in on-site releases to air of 24 other chemicals. The MTBE releases were evaporation from water processed in their wastewater treatment plant. When product storage tanks are drained, water in the tanks is separated from product. This water, which sometimes contains MTBE, is sent to the on-site treatment plant. Some of this change may be due to a change in sampling procedure. The reason for the sulfuric acid increase was that Motiva has ceased using their stack gas scrubber, a part of the fuel burning operation. Motiva is converting to a new fuel process, and will use another treatment for sulfur reduction. Although these are significant increases, of the 36 chemicals covered in their report, 24 showed reductions in on-site releases from 1999.

DuPont Seaford, #4 on the list of on-site releases, showed an increase of 9%, or 66,750 pounds. Hydrochloric acid gas contributed 56,000 pounds toward this increase, some of which was due to an increase in the production index. Sulfuric acid gas contributed the remainder of the increase. Both gasses result from coal consumption at their power plant.

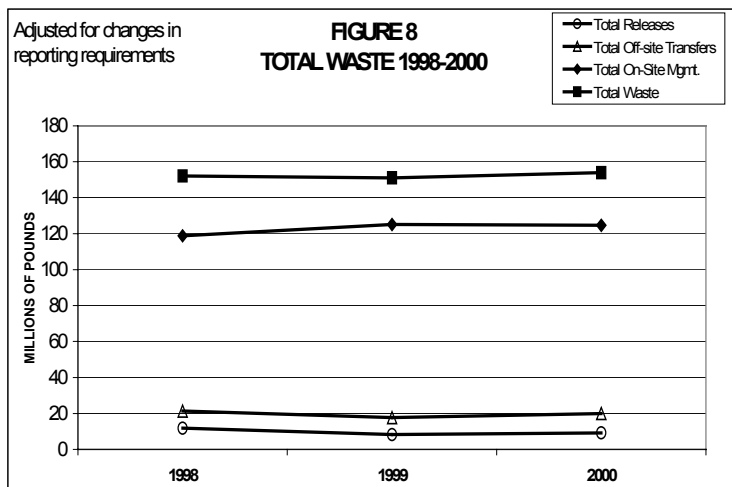
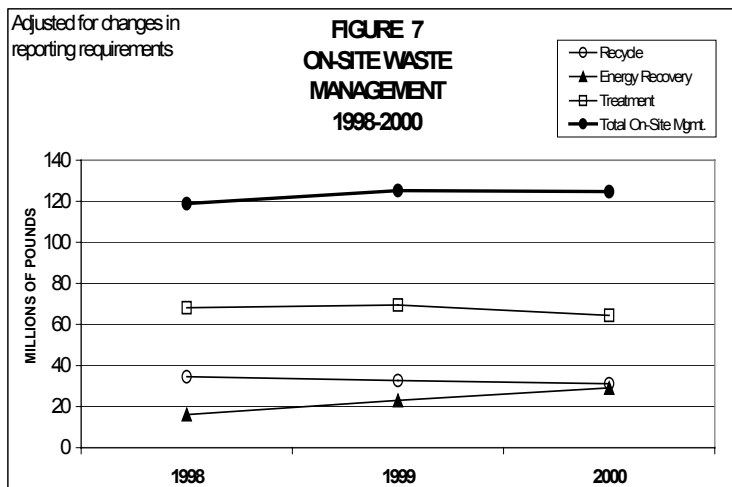
Off-Site Transfers for 1998-2000 shown in Figure 6 show a small decrease of 6.4%, but an increase of 13.5% in 2000, the result of increases in off-site treatment and energy recovery. CIBA Specialty Chemicals reported increases of 1,631,000 pounds in off-site treatment; 1,476,795 pounds were from methanol. Noramco reported an increase in dichloromethane of 260,100 pounds.



Off-Site Energy Recovery showed CIBA reporting an increase of 506,000 pounds of methanol, and Rodel reporting an increase of 499,000 pounds of n,n-dimethylformamide.

The On-Site Waste Management trend is relatively flat, showing an increase of 5%. Again, shifts in the way specific chemicals are handled result in increases and decreases in the reported amounts that tend to keep the overall short-term trend from making large changes. As with the prior trend for 1995-2000 shown in Figure 3, the upward trend is driven by energy recovery increasing by 13 million pounds over this time period, and 6.1 million pounds in 1999-2000. This increase is offset by decreases in treatment of 5.1 million pounds and recycling of 1.4 million pounds.

Total waste, the sum of On-site Releases, Off-Site Transfers, and On-Site Waste Management, is shown in Figure 8 for the 1998-2000 time period. As with the prior analysis for 1995-2000 this trend is driven by On-site Waste management. The trend shows an increase of 1.2% for 1998-2000.



FOR FURTHER INFORMATION

Access to the TRI Files - DNREC is responsible for collecting, processing, and distributing information submitted by Delaware facilities under the TRI program. Additional information not contained in this report is available to the public through the EPCRA Reporting Program located within DNREC. The reports submitted by facilities are available for review through the Freedom of Information Act process from DNREC's Air Quality Management Office located at 156 South State Street in Dover. Custom reports can also be generated from the database. For information on placing a request, call the TRI Coordinator at (302) 739-4791 during business hours. An on-line FOIA application is also available at:

www.dnrec.state.de.us/dnrec2000/FOIA.asp.

Chemical Data Fact Sheets - A two-page fact sheet is available for most TRI chemicals reported in Delaware and contains information on chemical characteristics, health hazards, and ecological effects. These fact sheets were prepared by the EPCRA Reporting Program from information obtained through EPA's more lengthy TRI chemical fact sheets. The two-page fact sheets are available upon request. Additional TRI chemical information is available at: www.epa.gov/triinter/chemical/index.htm

EPA's TRI Home Page - The TRI home page provides information on the many facets of the TRI program at EPA, including an Executive Summary, Q&A's, a link to the 2000 TRI data, a current list of reportable chemicals, reporting forms, state and federal program contacts, and various guidance documents available for downloading. This website has many links to other EPA and non-EPA sites associated with TRI.

www.epa.gov/tri/

Toxics Release Inventory Public Data Release - EPA's annual TRI report. It covers information nationwide and provides a good perspective on how Delaware compares to other states. The latest version of this report is available for review at the DNREC office at 156 South State Street in Dover or can be obtained by calling the EPCRA Information Hotline at 1-800-535-0202.

www.epa.gov/tri/tridata/tri00/index.htm

Envirofacts Electronic warehouse - Envirofacts is an EPA-developed website that provides public access to multiple environmental databases, including TRI. Links can be made to data about hazardous waste, water permits, drinking water, Superfund sites, and more. On-line queries allow the user to retrieve data and create reports, as well as generate maps.

www.epa.gov/enviro

Right-to-know Network Searchable nationwide TRI data is available through RTKNet. The RTKNet was established by two non-profit organizations to provide access to TRI and chemical data, link TRI with other environmental data, and exchange information among public interest groups. www.rtk.net

The Office of Pollution Prevention & Toxics is a part of the EPA that:

- Promotes pollution prevention as the guiding principle for controlling industrial pollution;
- Promotes safer chemicals through a combination of regulatory and voluntary efforts;
- Promotes risk reduction so as to minimize exposure to existing substances such as lead, asbestos, dioxin, and polychlorinated biphenyls; and,
- Promotes public understanding of risks by providing understandable, accessible and complete information on chemical risks to the broadest audience possible.

It is also a link to *Risk-Screening Environmental Indicators*. This model was developed by EPA's Office of Pollution Prevention & Toxics as a risk screening tool that provides a relative comparison of TRI releases. This application is available on CD-ROM or through the Internet. Both of these are available through:

www.epa.gov/opptintr

Environmental Defense Fund Scorecard - The EDF Scorecard combines scientific, geographic, technical, and legal information from many databases (with emphasis on TRI) to enable users to produce detailed local reports on toxic chemical pollution. Chemical profiles and a map generator are also available through the Scorecard.

www.scorecard.org

2000 Delaware Air Quality Report - The annual air quality report is prepared by the Air Surveillance Branch in the Air Quality Management Section of DNREC. This report presents data gathered from a statewide network of air monitoring stations, and includes analyses, trends, and other information regarding Delaware's ambient air quality. For a copy of the report, or for more information, please call (302) 323-4542. This report is available on-line at:

www.dnrec.state.de.us/air/aqm_page/reports.htm

Delaware's Department Of Natural Resources and Environmental Control has a variety of environmental information available at:

www.dnrec.state.de.us/dnrec2000/

In addition to TRI, there are other provisions of the Emergency Planning and Community Right to Know Act (EPCRA) which provide information to the public as well as to local emergency planning and response organizations. Delaware has its own EPCRA statute, which established these provisions under state law. For additional information, visit the Delaware EPCRA website at

www2.state.de.us/serc

Questions or comments regarding TRI are welcome. Please direct questions, comments, or requests to:

TRI Coordinator
EPCRA Reporting Program
Air Quality Management Section
Division of Air and Waste Management, DNREC
156 South State Street
Dover, DE 19901
Tel. (302) 739-4791, Fax (302) 739-3106
E-mail: john.parker@state.de.us